



THE WARRIOR

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Chute! Score!

*PM Force Sustainment Systems
(PM FSS) provides Low Cost
Aerial Delivery Systems
(LCADS) for humanitarian relief
efforts*

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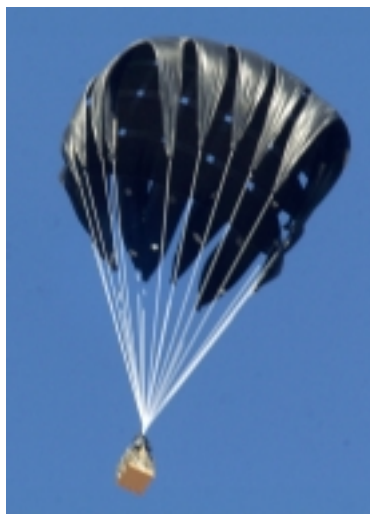
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Courtesy photo

Cover photo: PM Force Sustainment Systems (PM FSS) has developed a Low Cost Aerial Delivery System (LCADS) that provides a one-time-use, resupply and humanitarian relief capability. The system reduces the cost of the aerial delivery equipment left behind when recovery is difficult or impractical.



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Feeding the Warfighter

Director of the DoD Combat Feeding Directorate receives Decoration for Exceptional Civilian Service

Gerald Darsch, director of the DoD Combat Feeding Directorate (CFD), part of the Natick Soldier Center, has received the Decoration for Exceptional Civilian Service Award for more than 30 years of outstanding contributions to the U.S. Armed Forces. The award is the highest honorary award granted by the Secretary of the Army.

Darsch received the award for his professionalism, innovation, dedication, outstanding leadership, demonstrated customer focus and personal commitment to excellence and achievement in food science, combat ration development, and combat feeding systems.

Darsch's philosophy of "Warfighter Recommended, Warfighter Tested, Warfighter Approved" has resulted in a truly world-class Combat Feeding Program. Under Darsch's leadership, Meals, Ready-to-Eat (MREs) have become recognized worldwide as the standard of excellence for individual combat rations. More than 160 new items have been approved for the MRE since 1993. In addition, more than 150 new items have been added to the Unitized Group Rations (UGRs). During Darsch's tenure, numerous improvements and technology insertions have been made to other ration platforms to enhance warfighter acceptability, performance, and readiness.

Key innovations made to the family of combat rations include the Flameless Ration Heater, Meal Cold Weather/Long Range Patrol, Polymeric Tray, Shelf Stable Bread, Carbohydrate Supplement Pack, Novel Non-thermal Food Processing, Time Temperature Indicators, Nutritional Labeling, HooAH! Bar, Shelf Stable Pocket Sandwich, the new First Strike Ration, and the self-heating UGR-Express. Improved combat feeding systems to dramatically enhance quality of life of the Marine Corps, Navy, and Air Force have also been fielded.

Since 2004, the CFD transitioned more than 23 technologies into the hands of the Warfighter. CFD has been widely recognized for its numerous patents, publications, technical excellence, and support to coalition forces. Darsch made it clear that this award is not a reflection on a single individual but rather the customer focus of a world-class team.

Gerald Darsch, director of the DoD Combat Feeding Directorate, made it clear that this award is not a reflection on a single individual but rather the customer focus of a world-class team.



Gerald Darsch, director of the DoD Combat Feeding Directorate (CFD), has received the highest honorary award granted by the Secretary of the Army.

Gains for pain

Scientists at the U.S. Army Research Institute of Environmental Medicine (USARIEM) are making gains for prevention and management of injury and pain

By Jane Benson
Editor

Scientists at the U.S. Army Research Institute of Environmental Medicine (USARIEM) hope to improve Warfighter performance using their knowledge of musculoskeletal injuries and the effects of non-steroidal anti-inflammatory drugs (NSAIDs) on the body.

Warfighters have extreme physical demands placed on their bodies, including the need to move rapidly while carrying heavy loads over difficult terrain. As a result musculoskeletal injuries—which include injuries of bones, joints, ligaments, tendons, muscles and other soft tissues—are prevalent among the nation's Warfighters.

According to Dr. Edward Zambraski, division chief, Military Performance Division, USARIEM, "Musculoskeletal injuries are one of the top medical problems reported by Soldiers, especially during their physical training."

Musculoskeletal injuries may impact not only a Warfighter's ability to do his job well, but can also result in significant time away from his job to allow for recovery. In some cases, the injuries can lead to a disability discharge.

According to Dr. Paul Amoroso, an Army colonel and USARIEM research epidemiologist, musculoskeletal injuries are the number one cause of disability discharge.

By investigating the prevalence of musculoskeletal injuries and assessing how Soldiers are being trained, USARIEM scientists hope to find ways to improve Soldier performance while reducing injury. The scientists also hope to reduce the downtime caused by Warfighter injuries.

Problems with musculoskeletal training injuries have been studied most frequently during Basic Combat Training (BCT). It is not unusual for 25 percent of men and 50 percent of women basic trainees to experience a musculoskeletal injury. USARIEM, in collaboration with the U.S. Army Center for Health Promotion and Preventive Medicine at Aberdeen Proving Ground, Md., has been investigating basic training injuries since 1980.

Zambraski, a leading expert on the effects on NSAIDs on kidney function, said that much of Soldier use, and overuse, of NSAIDs is driven by their high rate of musculoskeletal injuries.

In an effort to keep going, many Warfighters rely on NSAIDs, such as ibuprofen, aspirin, and naproxen.

According to Dr. Edward Zambraski, division chief, Military Performance Division, U.S. Army Research Institute of Environmental Medicine (USARIEM), one goal of USARIEM's research program is to reduce musculoskeletal injuries, which would have the beneficial effect of reducing the need for non-steroidal anti-inflammatory drugs (NSAIDs) among Soldiers.

These pain relievers are fine in small doses, said Zambraski, but problems arise when Warfighters take them too frequently at too high a dosage.

Zambraski explained that NSAIDs work by temporarily blocking the body's natural production of prostaglandins (PGs). PGs promote inflammation and pain, but also perform other important and essential bodily functions.



Warrior/Underhill

In an effort to keep going, many Warfighters rely on non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, aspirin, and naproxen.

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In the stomach, PGs protect the lining from acid. By taking too many NSAIDs, Warfighters put themselves at risk for ulcers or other gastrointestinal problems.

In the kidneys, vasodilator PGs widen blood vessels, helping to maintain renal blood flow and to protect kidney function.

According to Zambraski, one goal of USARIEM's research program is to reduce musculoskeletal injuries which would have the beneficial effect of reducing the need for NSAIDs among Soldiers. This research is also examining the effects of other compounds that can reduce inflammation and pain, but not decrease the body's production of beneficial PGs.

Chute! Score!

PM Force Sustainment Systems (PM FSS) provides Low Cost Aerial Delivery Systems (LCADS) for humanitarian relief efforts

By Jane Benson
Editor

The PM Force Sustainment Systems (PM FSS) Cargo Aerial Delivery Team has worked successfully to address a major problem associated with humanitarian relief aerial delivery operations: How to reduce the cost of equipment that needs to be left behind when recovery is difficult or impractical?

According to Nina Shopalovich, the Low Cost Aerial Delivery System (LCADS) lead, the need for a low cost alternative to existing aerial delivery systems began to come to light in 1993.

"During Operation Provide Promise, the U.S. military worked to keep food and medical supplies from multiple countries moving into Bosnia throughout nearly four years of war. More than \$31 million of standard airdrop equipment was used and was never recovered and stocks were depleted," said Shopalovich.

"The low cost containers have been dropped into isolated mountain villages in Afghanistan which during the winter were cut off by snow, with no way to get supplies or humanitarian aid in by trucks." Nina Shopalovich, the Low Cost Aerial Delivery System (LCADS) lead for PM Force Sustainment Systems (PM FSS).



Courtesy photo

Low cost containers await loading for aerial delivery. The containers, made of polypropylene, are capable of containing loads of up to 2,200 pounds and provide a low cost alternative to the A-22 Cargo Container.

“These low cost components actually exceed the performance of the more expensive standard container delivery components. The parachutes have a very forgiving design and it is easy to pack and rig them. They’re popular with the troops, and we’ve started to receive phone calls from the field asking where they can obtain them.” Nina Shopalovich, LCADS lead for PM FSS.

In 2002, the PM FSS Cargo Aerial Delivery Team was tasked with finding a solution that would assist the U.S. military by providing a one-time-use, resupply and humanitarian relief capability for use in both low velocity and high velocity airdrop. The program, entitled the Low Cost Aerial Delivery System, would result in dramatic cost savings to the military and subsequently the taxpayer as a result of the low cost of the system components.

This requirement was met by the LCADS Team with the development of three components, each providing a low cost alternative to the standard components currently used for container delivery. Each component in the LCADS represents a 55 to 80 percent cost reduction from the corresponding standard component.

The first component, the polypropylene container, is capable of containing loads of up to 2,200 pounds and provides a low cost alternative to the A-22 Cargo Container. This container used as its basis a design that had been developed over a number of years by engineers and technicians at the U.S. Army Soldier Systems Center in Natick, Mass. It has now been fielded and is being used in Iraq and Afghanistan.

“The low cost containers have been dropped into isolated mountain villages in Afghanistan which during the winter were cut off by snow, with no way to get supplies or humanitarian aid in by trucks,” said Shopalovich. The low cost containers are also being used to resupply troops in Iraq.



Courtesy photo

Low cost containers are airdropped and land with contents intact.

The recently fielded, high velocity parachute provides an alternative to the 26-foot ring-slot parachute used to airdrop cargo from altitudes of up to 25,000 feet above ground level. The low velocity parachute, suitable for airdrop at lower altitudes, provides the low cost alternative to the G-12 cargo parachute. The low velocity parachute is in its final phase of operational testing and will be ready for fielding in early 2007.

Both parachutes were designed by Bruce Bonaceto, an engineer in the PM FSS Cargo Aerial Delivery Team, and utilize a patented “spider” design with strips of polypropylene sewn in a distinctive cross-hatch pattern and suspension lines that are knotted to the parachute “legs”.

The older, standard high and low velocity parachutes are complex in design, whereas the new low cost parachutes are simple, use readily available polypropylene, and can be produced by a wide range of fabricators with a shorter lead time.

“In emergency situations, we used to turn to specialized parachute manufacturers, whose workload often caused production to bottleneck during a surge in demand. The simplicity of the high and low velocity parachute designs, as well as that of the containers, enables the LCADS components to be produced by many small, less specialized companies,” said Shopalovich.



Courtesy photo

The recently fielded, high velocity parachute provides an alternative to the 26-foot, ring-slot parachute used to airdrop cargo from altitudes of up to 25,000 feet above ground level.



Courtesy photo

The low cost container, used here in conjunction with the G-12 parachute, is tested at Yuma Proving Ground, Ariz.



Courtesy photo

The low velocity parachute, suitable for airdrop at lower altitudes, provides the low cost alternative to the G-12 cargo parachute. The low velocity parachute is in its final phase of operational testing and will be ready for fielding in early 2007.

The ability for companies to produce the parachute components rapidly also keeps storage costs to a minimum. There is no need to keep large stocks on hand and the number of parachutes produced can be tailored to fit the need of a particular disaster or emergency situation.

The increased number of suitable manufacturers enables a much more rapid response to emergency situations.

The ability for companies to produce the components rapidly also keeps storage costs to a minimum. There is no need to keep large stocks on hand and the number of parachutes produced can be tailored to fit the need of a particular disaster or emergency situation.

According to Shopalovich, "These low cost components actually exceed the performance of the more expensive standard container delivery components. The parachutes have a very forgiving design and it is easy to pack and rig them. They're popular with the troops, and we've started to receive phone calls from the field asking where they can obtain them."

Editor's note: For more information on obtaining the LCADS, please contact Frank Svoboda, Integrated Logistics Support Center (ILSC) airdrop item manager at 508-233-6033 or DSN 256-6033.

Kudos corner

Awards

Natick Soldier Center employee receives Society of Automotive Engineers (SAE) International's Arch T. Colwell Merit Award

Dr. Brian Corner, a research anthropologist in the Supporting Science and Technology Directorate, part of the Natick Soldier Center, was presented with the Society of Automotive Engineers (SAE) International's Arch T. Colwell Merit Award during the SAE 2006 World Congress in Detroit, Mich., on April 4.

The award recognizes authors of outstanding papers presented at SAE meetings. Corner, along with Dr. Martin Friess, a research anthropologist for AnthroTech, were recognized for co-authoring a paper entitled from *XS to XL: Statistical Modeling of Human Body Shape Using 3D Surface Scans*.

Papers are judged primarily for their value as new and original contributions to existing knowledge of mobility engineering. Corner's work focuses mainly on analyzing and applying three-dimensional digitized data for clothing and individual equipment design. Corner's paper was chosen from 2,677 entries.

The paper was presented originally at the 2004 Digital Human Modeling (DHM) for Design and Engineering Symposium. DHM is involved with the development and application of digital human models within mobility engineering.



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Dr. Brian Corner, a research anthropologist in the Supporting Science and Technology Directorate, part of the Natick Soldier Center, was recognized for his original contributions to existing knowledge of mobility engineering.

Patents

Patent Issued: 7,022,420 B2

Date: April 4, 2006

Inventors: Ferdinando Bruno and Lynne Samuelson

Title: Assembled Hematin, Method for Forming Same and Method for Polymerizing Aromatic Monomers Using Same

Description: An assembled hematin is formed by depositing hematin on an electrically charged substrate in one or more layers alternating with one or more layers of polyelectrolyte, preferably a cationic polymer.

Patent Issued: US 7,028,951 B1

Date: April 18, 2006

Inventors: James E. Sadeck

Title: Parachute Reefing System

Description: The present invention is directed to a parachute reefing system having a flexible ring section. The flexible ring section has a circumference. The reefing system includes a plurality of equidistantly spaced loops attached to the flexible ring section and a plurality of link members wherein each link member is attached to a corresponding loop and sized to allow at least one suspension line to pass there-through.

Patent Issued: US 7,033,769 B2

Date: April 25, 2006

Inventors: Charlene M. Mello, Steven Michael Arcidiacono, and Jason William Soares

Title: Method for Discovering One or More Peptides Adapted for Specific Binding to a Microorganism of Interest

Description: A method for discovering one or more peptides adapted for specific binding to a microorganism of interest. The method comprises (i) identifying an antimicrobial peptide having antimicrobial activity against the microorganism of interest, (ii) generating a library of first generation mutants of the antimicrobial peptide, each of the first generation mutants differing from the antimicrobial peptide by a small number of amino acid substitutions, additions or deletions, (iii) screening the library of first generation mutants for those first generation mutants that bind to the microorganism of interest, (iv) determining the peptide sequences of those first generation mutants that bind to the microorganism of interest, and (v) if necessary, repeating steps (ii) through (iv) for one or more successive generations of mutants until one or more consensus peptide sequences emerge.

If you would like to submit news regarding an award, patent, or other accomplishment, please email IMNE-SSC-PA@natick.army.mil. Items are run on a space-permitting basis and are subject to editing.



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